

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the above-identified application:

Claim 1 (Currently Amended) A joint for connecting a duct to a port comprising:

an annular flange, having a sealing flange disposed radially outward therefrom, the annular flange fixedly attached to the duct;

a female mating flange, having female threads disposed internally thereon, the female mating flange fixedly attached to the port;

an annular seat collar having male threads disposed externally thereon, wherein the male threads are threadably attachable to the female threads and the annular seat collar having a surface contacting the sealing flange when the joint is assembled;

[[and]]

a plurality of tabs spaced around an outer annular surface of the annular seat collar including channels formed therebetween: and

a locking ring disposed over at least a portion of a circumference of the female mating flange, the locking ring including end portions that are bent outward from the tab channels, thereby preventing rotational motion of the annular seat collar when the joint is assembled.

Claim 2 (Original) The joint according to claim 1, further comprising a bellows seal sealingly positioned between the sealing flange and the female mating flange.

Claim 3 (Cancelled).

Claim 4 (Currently Amended) The joint according to claim [[3]]¹ wherein the locking ring is disposed in a channel in the female mating portion.

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

Claim 5 (Cancelled).

Claim 6 (Cancelled).

Claim 7 (Original) The joint according to claim 1, wherein the joint has a length of less than about 2.5 inches, and a diameter of less than about 1.1 inches greater than the diameter of the duct.

Claim 8 (Original) The joint according to claim 1, wherein the joint has a length of less than about 1.5 inches, and a diameter of about 1.0 inch greater than the diameter of the duct.

Claim 9 (Original) The joint according to claim 1, further comprising:
a protuberance on a distal end, relative to the port, of the female mating flange; and

a radial face axially positioning the annular seat collar to contact the protuberance when the annular seat collar is threadably attached the port, thereby maintaining the working cavity length for the joint.

Claim 10 (Original) The joint according to claim 1, further comprising a grip integrally formed with the annular seat collar, the grip allowing for a user to threadably mate the annular seat collar with the female mating flange, thereby assembling the joint.

Claim 11 (Original) The joint according to claim 1, wherein the duct is attached to the annular flange with a weld.

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

Claim 12 (Original) The joint according to claim 1, wherein the port is attached to the female mating flange by either a weld or by forming the port integrally with the female mating flange.

Claim 13 (Withdrawn) The joint according to claim 1, wherein the duct is used to duct air from a compressor to a combustor of a turbomachine.

Claim 14 (Withdrawn) The joint according to claim 13, wherein the turbomachine is used to power an aircraft.

Claim 15 (Currently Amended) A low profile tension style flexible joint comprising:

an annular flange, having a sealing flange disposed radially outward therefrom, the annular flange fixedly attached to the duct;

a female mating flange, having female threads disposed internally thereon, the female mating flange fixedly attached to the port;

an annular seat collar having male threads disposed externally thereon;

a bellows seal sealingly positioned between the sealing flange and the female mating flange;

a locking ring disposed over at least a portion of a circumference of the female mating flange and including end portions; and

a plurality of tabs spaced around an outer annular surface of the annular seat collar including channels formed therebetween;

wherein

the male threads threadably attach the female threads; [[and]]

the annular seat collar has a spherical portion contacting the sealing flange when the joint is assembled; and

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

the locking ring includes end portions bent outward from the tab channels, thereby preventing rotational motion of the annular seat collar when the joint is assembled.

Claim 16 (Original) The joint according to claim 15, wherein the locking ring is disposed in a channel in the female mating portion.

Claim 17 (Cancelled).

Claim 18 (Original) The joint according to claim 15, wherein the joint has a length of less than about 1.5 inches and a diameter of about 1.0 inch greater than the diameter of the duct.

Claim 19 (Original) The joint according to claim 15, further comprising:
a protuberance on a distal end, relative to the port, of the female mating flange; and

a radial face axially positioning the annular seat collar to contact the protuberance when the annular seat collar is threadably attached the port, thereby maintaining the working cavity length for the joint.

Claim 20 (Original) The joint according to claim 15, further comprising a grip integrally formed with the annular seat collar, the grip allowing a user to threadably mate the annular seat collar with the female mating flange, thereby forming the joint.

Claim 21 (Original) The joint according to claim 15, wherein:
the duct is attached to the annular flange with a weld; and
the port is attached to the female mating flange by a weld or by forming the port integrally with the female mating flange.

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

Claim 22 (Currently Amended) A low profile tension style flexible joint for use in ducting compressor air to a turbomachine combustor, comprising:

an annular flange, having a sealing flange disposed radially outward therefrom, the annular flange fixedly attached to the duct;

a female mating flange, having female threads disposed internally thereon, the female mating flange fixedly attached to the port;

an annular seat collar having male threads disposed externally thereon;

a bellows seal sealingly positioned between the sealing flange and the female mating flange;

a protuberance on a distal end, relative to the port, of the female mating flange;

a radial face axially positioning the annular seat collar to contact the protuberance when the annular seat collar is threadably attached the port, thereby maintaining the working cavity length for the joint;

a locking ring disposed in a channel over at least a portion of a circumference of the female mating flange, the locking ring including end portions; and

a plurality of tabs spaced around an outer annular surface of the annular seat collar including channels formed therebetween; wherein

the male threads threadably attach to the female threads;

the annular seat collar has a spherical portion contacting the sealing flange when the joint is assembled; [[and]]

the joint has a length of less than about 1.5 inches and a diameter of about 1.0 inch greater than the diameter of the duct; and

the locking ring end portions are bent outward from the tab channels, thereby preventing rotational motion of the annular seat collar when the joint is assembled.

Claim 23 (Cancelled).

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

Claim 24 (Original) The joint according to claim 22, further comprising a grip integrally formed with the annular seat collar, the grip allowing a user to threadably mate the annular seat collar with the female mating flange, thereby assembling the joint.

Claim 25 (Original) The joint according to claim 22, wherein:
the duct is attached to the annular flange with a weld; and
the port is attached to the female mating flange by a weld or the female mating flange is integral with the port .

Claim 26 (Currently Amended) A method for joining a duct and a port comprising:
attaching an annular flange to the duct, the annular flange having a sealing flange disposed radially outward therefrom;
providing a female mating flange attached to the port, the female mating flange having threads disposed internally thereon;
providing a plurality of tabs on the outer circumferential surface of the annular seat collar, the plurality of tabs including channels formed therebetween;
threadably engaging the female threads of the female mating flange with male threads of an annular seat collar having the male threads disposed externally thereon; [[and]]
threading the male threads with the female threads to a point to cause contact between a portion of the sealing flange and the annular seat collar;
disposing a locking ring over at least a portion of a circumference of the female mating flange;
bending end portions of the locking ring from the channel over the outer circumferential surface of the annular seat collar; and
engaging the end portions with the plurality of tabs thereby preventing rotational motion of the annular seal collar when the joint is assembled.

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

Claim 27 (Original) The method according to claim 26, further comprising positioning a bellows seal between a sealing surface of the sealing flange and a sealing surface of the female mating flange.

Claim 28 (Currently Amended) The method according to claim 26, further comprising disposing ~~a locking ring over at least a portion of a circumference of the female mating flange,~~ the locking ring being disposed in a channel in an outer circumference of the female mating portion.

Claim 29 (Cancelled).

Claim 30 (Original) The method according to claim 26, wherein the joint has a length of less than about 1.5 inches and a diameter of not more than about 1.0 inch greater than the diameter of the duct.

Claim 31 (Currently Amended) A pneumatic duct having at least one joint on at least one end thereof for attaching the duct to a port, the joint comprising:

- an annular flange having a sealing flange disposed radially outward therefrom, the annular flange attached to the duct;
- a female mating flange having female threads disposed internally thereon, the female mating flange attached to the port;
- an annular seat collar having male threads disposed externally thereon;
- a bellows seal positioned between the sealing flange and the female mating flange;
- a locking ring disposed in a channel over at least a portion of a circumference of the female mating flange and including end portions; and
- a plurality of tabs spaced around an outer annular surface of the annular seat collar including channels therebetween; wherein

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

the male threads threadably attach to the female threads; [[and]]
the annular seat collar having a spherical portion contacting the sealing
flange when the joint is assembled; and
the locking ring end portions are bent outward from the tab channels,
thereby preventing rotational motion of the annular seat collar when the joint is
assembled.

Claim 32 (Cancelled).

Claim 33 (Original) The pneumatic duct according to claim 31, wherein the joint has a length of less than about 1.5 inches and a diameter of not more than about 1.0 inch greater than the diameter of the duct.

Claim 34 (Withdrawn) A turbomachine having a duct for ducting compressor air to a combustor, comprising:

a low profile tension style flexible joint for connecting the duct to a port on the turbomachine, the low profile tension style flexible joint comprising:

an annular flange having a sealing flange disposed radially outward therefrom, the collar attached to the duct;

a female mating flange having female threads disposed internally thereon, the female mating flange attached to the port;

an annular seat collar having male threads disposed externally thereon;

a bellows seal sealingly positioned between the sealing flange and the female mating flange; and

a locking ring disposed in a channel over at least a portion of a circumference of the female mating flange; wherein

the male threads threadably attach to the female threads; and

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

the annular seat collar having a spherical portion contacting the sealing flange when the joint is assembled.

Claim 35 (Withdrawn) The turbomachine according to claim 34, wherein the low profile tension style flexible joint further comprises:

a plurality of tabs spaced around an outer annular surface of the annular seat collar; wherein

end portions of the locking ring are bent outward from the channel between adjacent tabs, thereby preventing rotational motion of the annular seat collar when the joint is assembled.

Claim 36 (Withdrawn) The turbomachine according to claim 34, wherein the low profile tension style flexible joint has a length of less than about 1.5 inches and a diameter of not more than about 1.0 inch greater than the diameter of the duct.

Claim 37 (Withdrawn) The turbomachine according to claim 34, wherein the low profile tension style flexible joint further comprises:

a protuberance on a distal end, relative to the port, of the female mating flange; and

a radial face axially positioning the annular seat collar to contact the protuberance when the annular seat collar is threadably attached the port, thereby maintaining the working cavity length for the joint.

Claim 38 (Withdrawn) The turbomachine according to claim 34, wherein the low profile tension style flexible joint further comprises a grip integrally formed with the annular seat collar, the grip allowing a user to threadably mate the annular seat collar with the female mating flange, thereby forming the joint.

Claim 39 (Withdrawn) The turbomachine according to claim 34, wherein:

Appl. No. 10/810,456

Amdt. Dated February 9, 2006

Reply to Office Action of January 3, 2006

the duct is attached to the annular flange with a weld; and
the port is attached to the female mating flange by a weld or by forming
the port integrally with the female mating flange.